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COMPUTATIONAL MODELLING OF TIMBER MATERIALS AND STRUCTURES

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ABSTRACT

Over the last few years, the challenges posed by climate change have placed timber in the centre of attention of several scientific communities, industry and public authorities. Wood and wood-based materials like cross or glued laminated timber – also known as engineered wood – are well suited materials for construction because they have an excellent strength-to-weight ratio and favourable seismic and insulation performances. Besides, timber-building materials have much lower embodied energy than concrete and steel and they are capable to reduce greenhouse gases by storing carbon emissions and keeping them out from the atmosphere. Therefore, several world trends have emerged in order to promote the use of wood-based materials and timber structures.

In spite of the evident advantages of building with timber, the benefits of using this material are still far from been maximized. This can be mainly attributed to the highly complex and intricate nature of wood, resulting in new designs mainly based on observation and experience and in a lack of confidence on computational simulations. This makes the numerical prediction of its response very challenging, at material and structural levels, and it represents an opportunity to apply and develop computational modelling techniques for the analysis of timber materials and structures. This Mini Symposium aims at bundling developments in this regard according to the following areas:

- Computational constitutive modelling to describe the mechanical response of timber
- Advanced computational techniques for the analysis of timber structures
- Computational modelling of composite timber structures

Contributions are invited with emphasis on theory, numerical methods and applications. These may address specific technical or mathematical details, conceptual developments and solution strategies, individual solutions, and may also provide overviews, comparative studies and experimental validation.